

PRACTICAL ATLAS: Blood Vessels

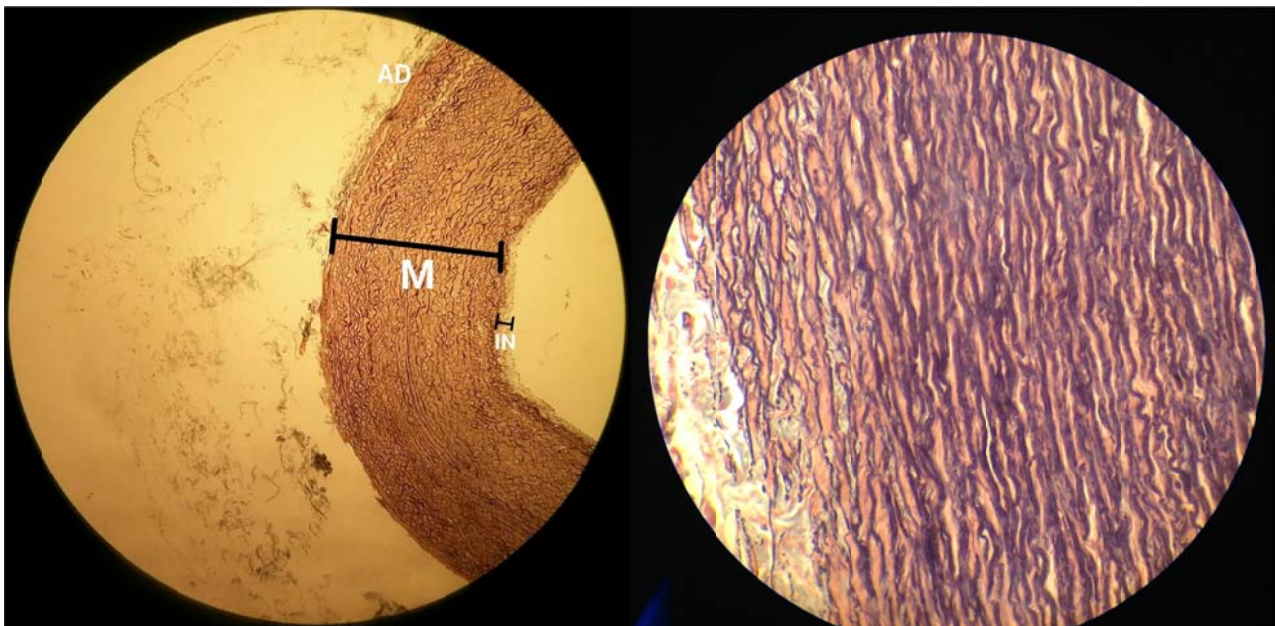
Large Blood Vessels

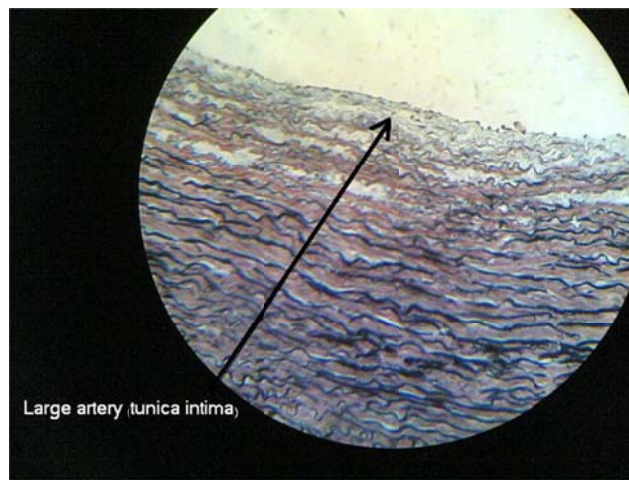
Note: be reminded that even unimportant “Tunica” layers may be asked as (marked structures), thus they are put with the features of the vessels in *Italic font*. **Please don't use them as features for the main tissue.**

Note: Large arteries are found by their media, while large veins are found by their adventitia.

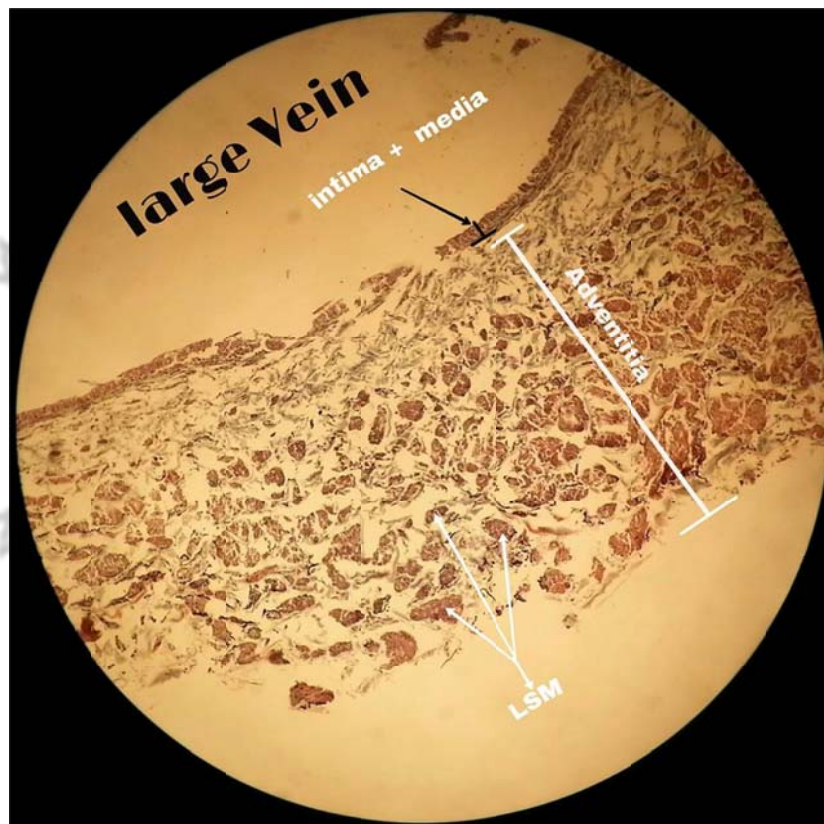
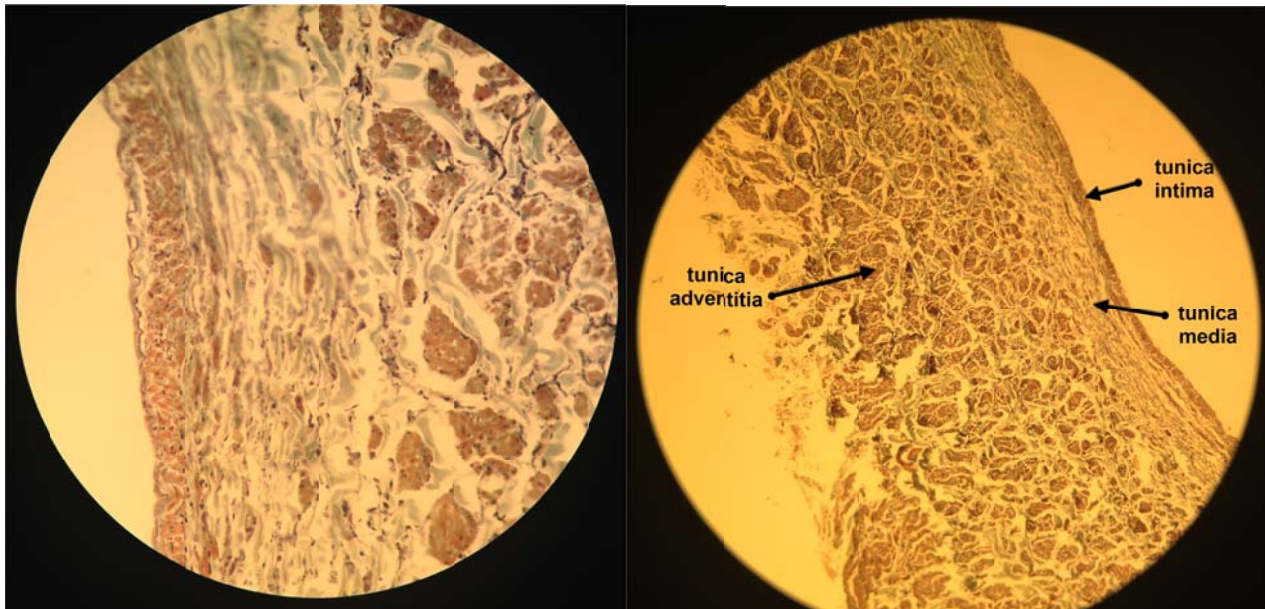
Large Artery “Elastic”	<ol style="list-style-type: none">1. Tunica Media: up to 70 concentric Elastic lamellae (fenestrated sheets) alternating with fine smooth muscle fibers.2. Internal/External Elastic Lamina of Intima/Media are not defined separately because of resemblance with elastic fiber of Tunica Media.3. Tunica Adventitia: Thin and may contain “vasa vasorum”4. Tunica Intima: <i>Endothelium and C.T. sub-endothelium are seen clearly.</i>
Large Vein	<ol style="list-style-type: none">1. Tunica Adventitia: very thick C.T. that contains longitudinal smooth muscles and relatively frequent number of vasa vasorum.2. Tunica Media: poorly developed (<i>little smooth muscle might be seen</i>).3. Tunica Intima: <i>are well developed but hardly differentiated from the media.</i>

Slide No. 1: Aorta (Large Artery)





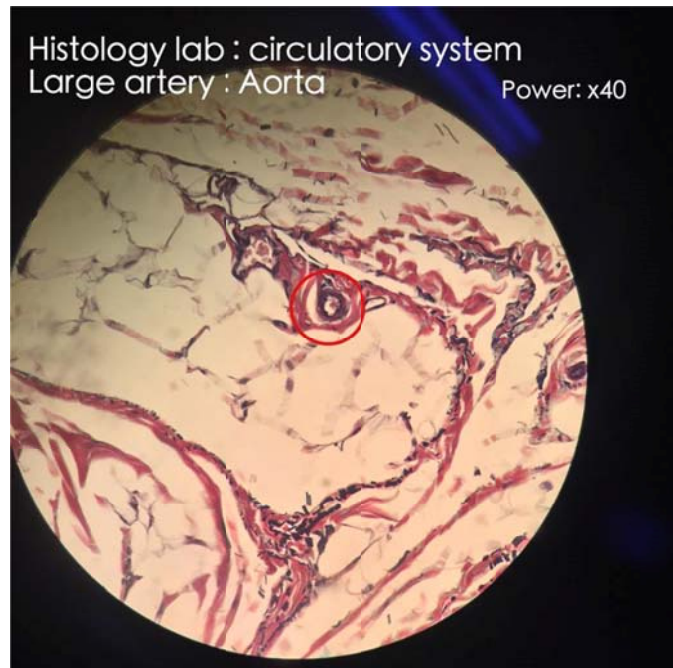
Slide No.2: Large vein



Marked Structure:

Vasa Vasorum

- **Location:** in the adventitia of large arteries and veins projecting into the outer part of the media.
- **Features:** very small blood vessels (????)



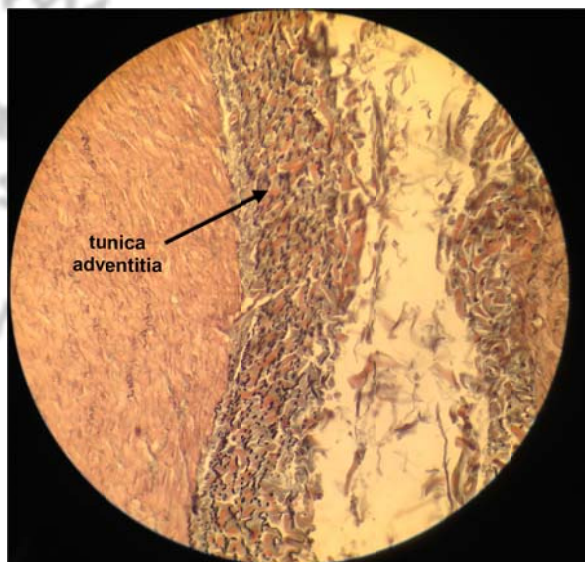
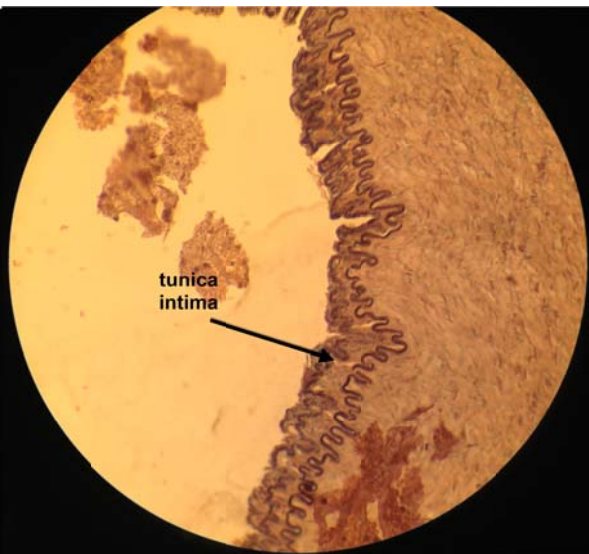
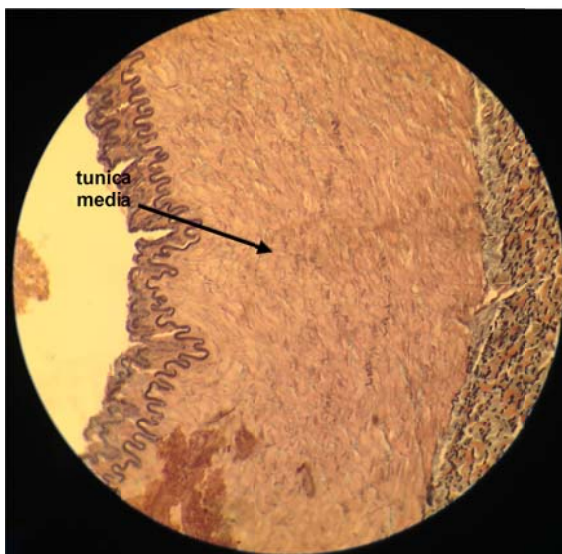
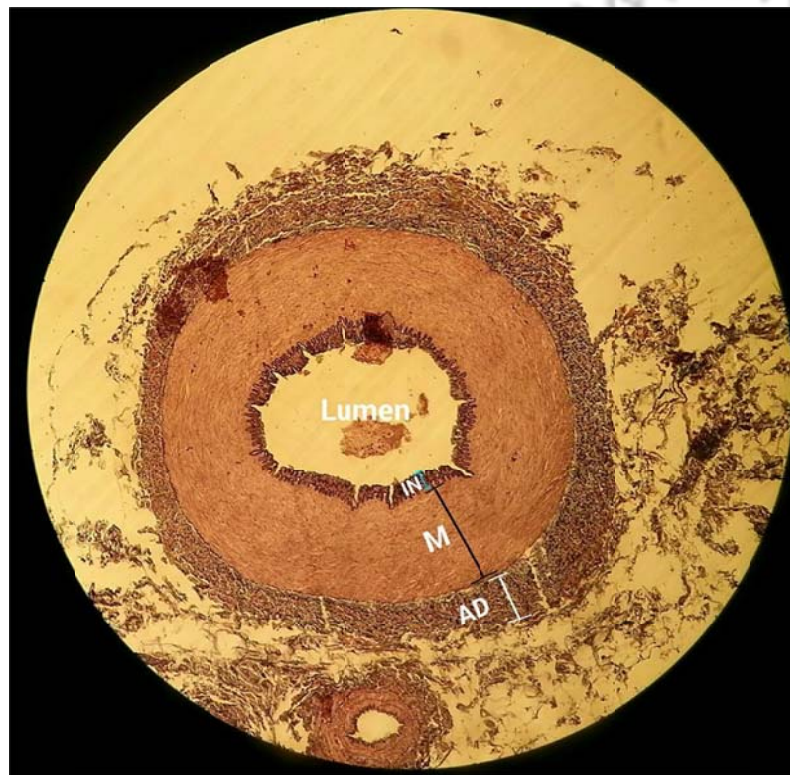
Medium-sized Blood Vessels

Note: First things first; are you looking at a medium or large vessel? Arteries are easy to identify (that's if you know the difference between muscle fibers and... elastic fibers), the veins on the other side, are differentiated by looking at the adventitia: **medium veins lack the longitudinal muscles feature of large veins.**

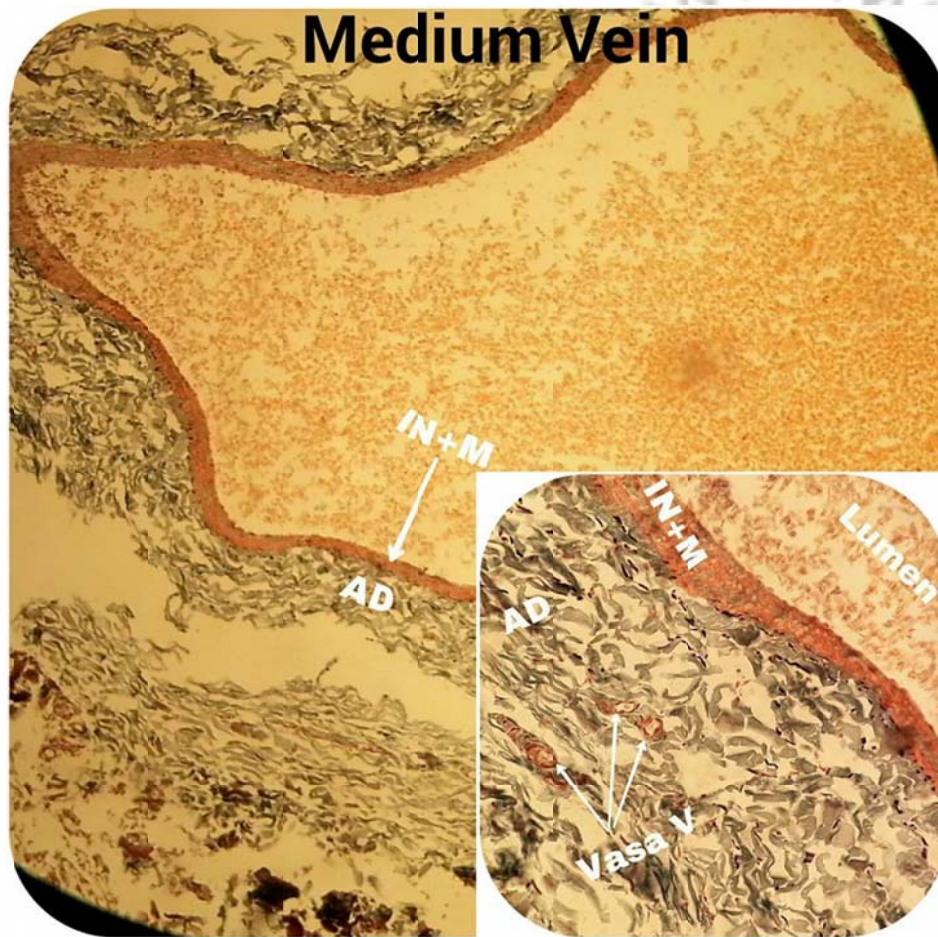
Note: Muscular arteries are found by their muscular media, and small/medium veins are found by their irregular lumen.

Muscular Artery "Distributing"	<ol style="list-style-type: none"> 1. Tunica Media: up to 40 layers of smooth muscles alternating with elastic fibers. 2. Internal Elastic Lamina Intima is very distinct (may be folded) –External Elastic lamina can be seen in large muscular artery. 3. (IF SEEN) – Tunica Adventitia: "External Elastic Membrane" seen as extensive elastic material. 4. Tunica Intima: Thin (Endothelium and C.T. sub-endothelium)
Medium Vein	<ol style="list-style-type: none"> 1. Tunica Adventitia: Well developed C.T. that contains longitudinally arranged collagen fiber and some elastic fibers. 2. Tunica Media: Although thin, it has 3-5 circular smooth muscles layers. 3. (IF SEEN) – Valves: loose, pocket-shaped folds of the tunica intima extending into the lumen of the vein. <ul style="list-style-type: none"> • Location: Head/Neck/Lower limbs small-to-medium veins. 4. Tunica Intima: are very thin and the internal elastic membrane is usually absent. <p>Note: Irregular lumen (important feature)</p>

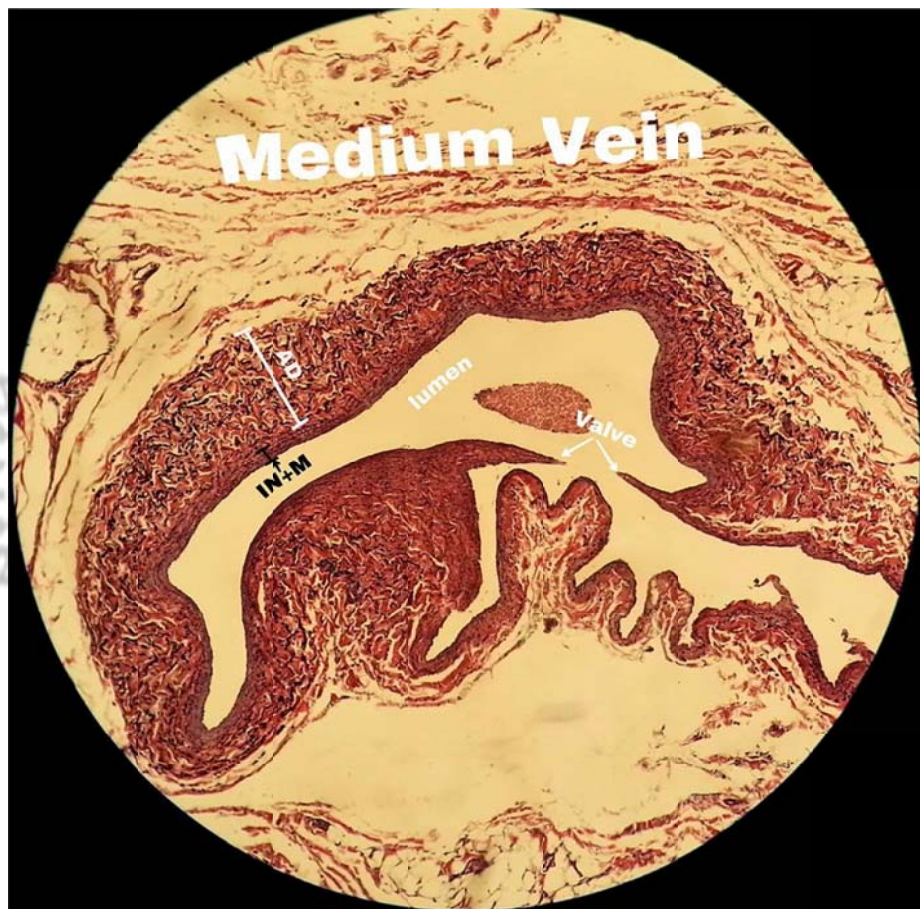
Slide No. 1: Muscular artery



Slide No. 2: Medium vein (no valve)



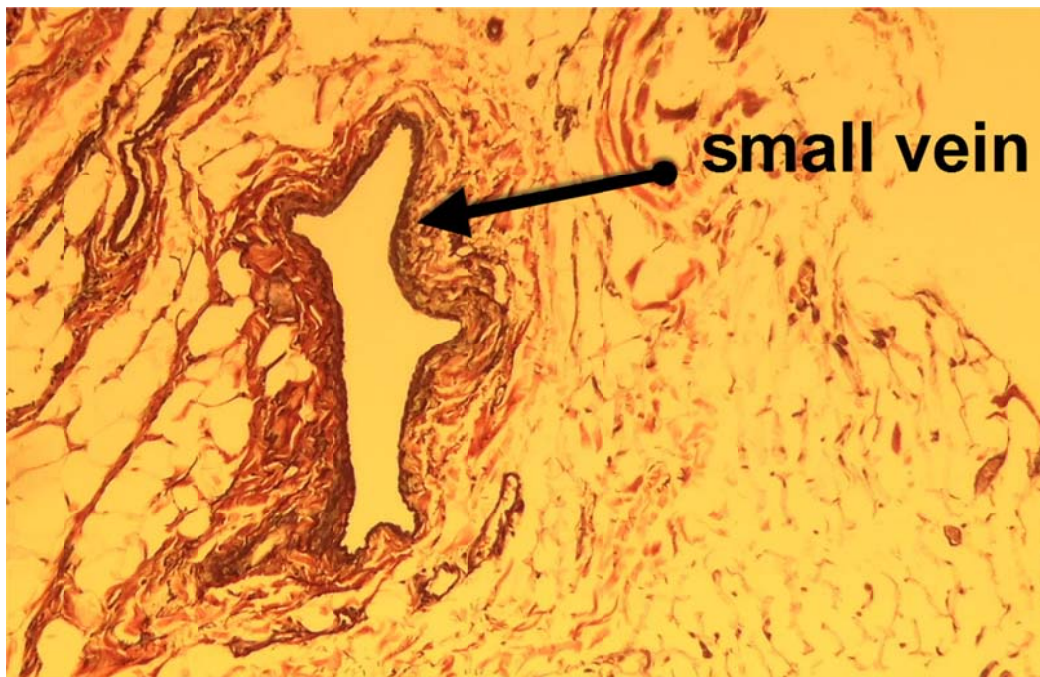
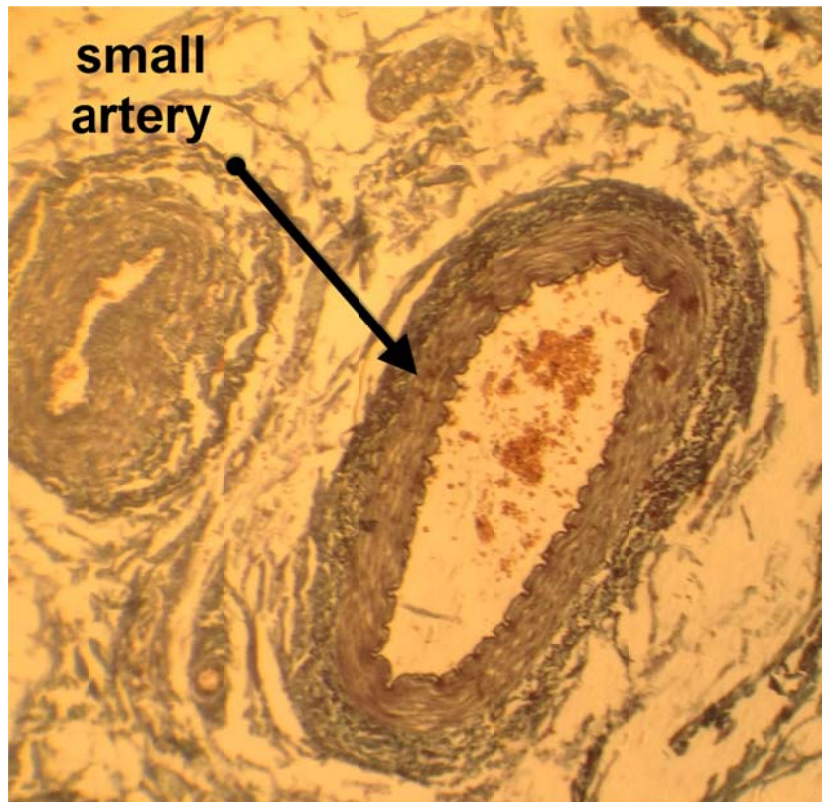
Slide No. 3: Medium vein (with valve)



Small-sized Blood Vessels

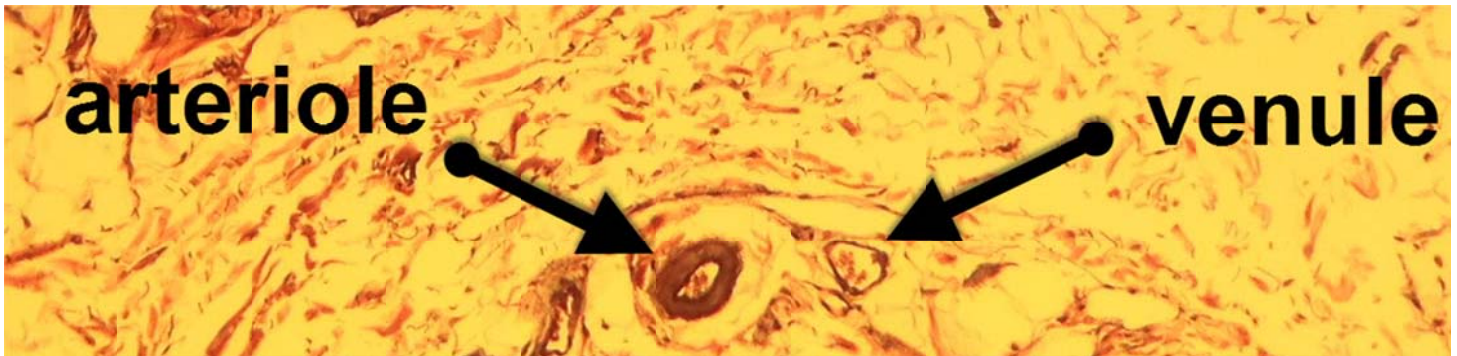
(From Junquiera's p.221)

Small Artery	<ol style="list-style-type: none">1. Tunica Media: 3-10 layers of smooth muscles.2. Adventitia C.T. thinner than media
Small Vein	<ol style="list-style-type: none">1. Tunica Media: Although thin, it has 2-3 circular smooth muscles layers.2. Adventitia C.T. thicker than media. <p>Note: Irregular lumen (important feature)</p>

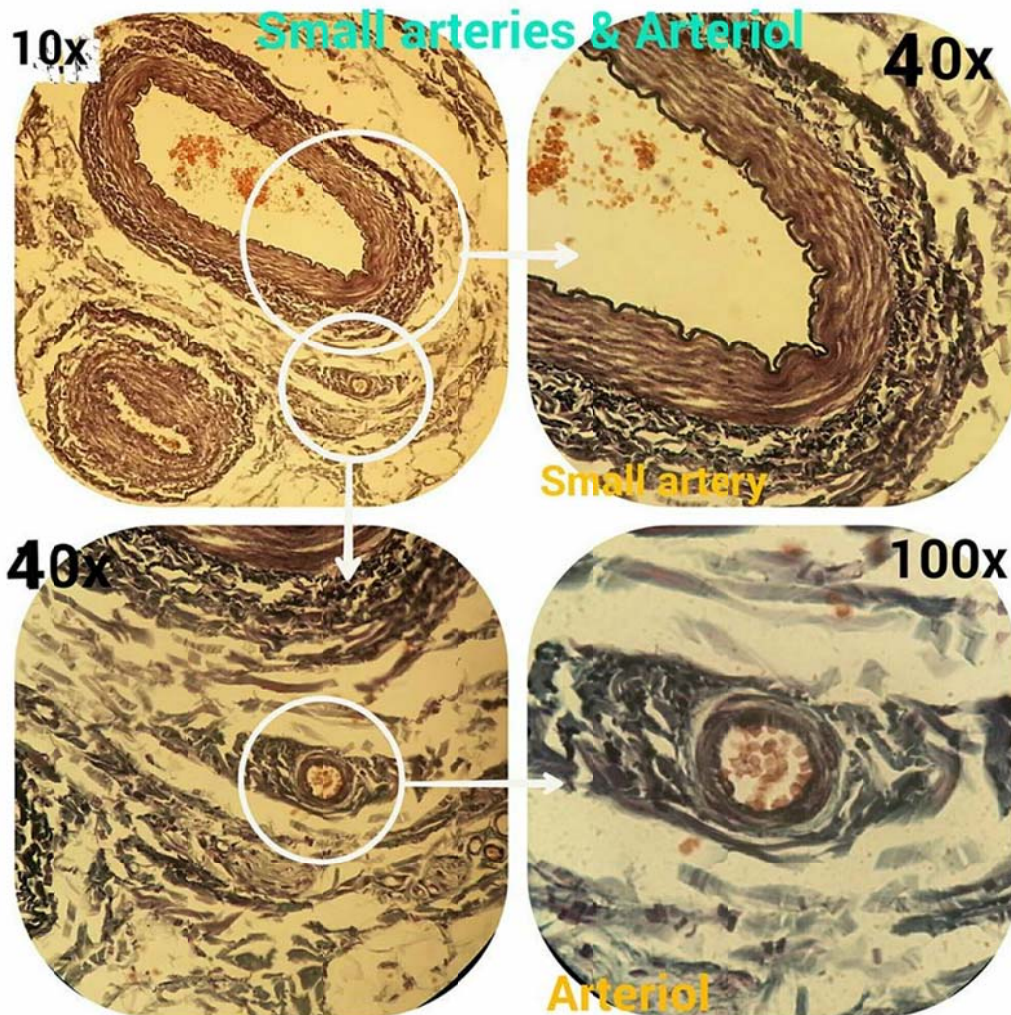


Smaller-sized Blood Vessels

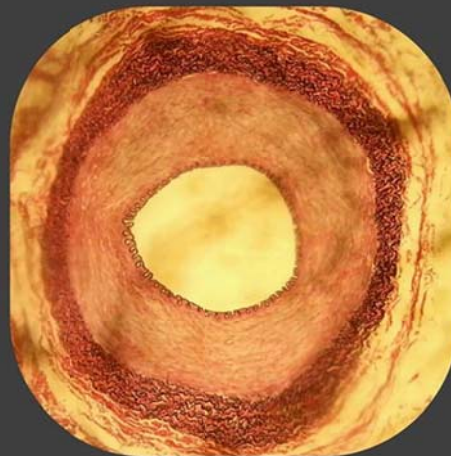
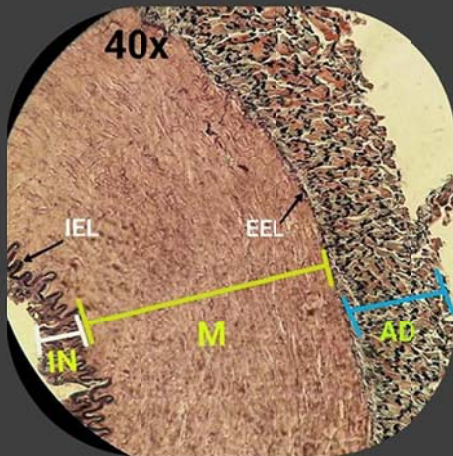
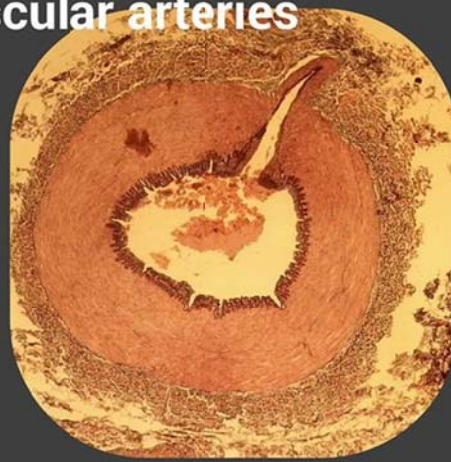
Arteriole	<ol style="list-style-type: none"> 1. Tunica Media: 1-2 layers of circular smooth muscles. 2. Elastic laminae are absent, and a sub-endothelial layer is thin.
Venule	<ol style="list-style-type: none"> 1. Tunica Media: Scattered 1-3 circular smooth muscle cells 2. Tunica Intima: thin endothelium margined by an outer sheath of collagen fibers – Collagen fibers are also found between media muscle cells and longitudinally in adventitia. <p>Note: Irregular lumen (important feature)</p>



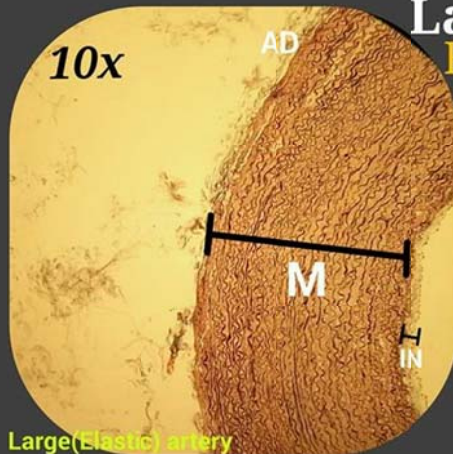
Review (Thanks Mustafa!)



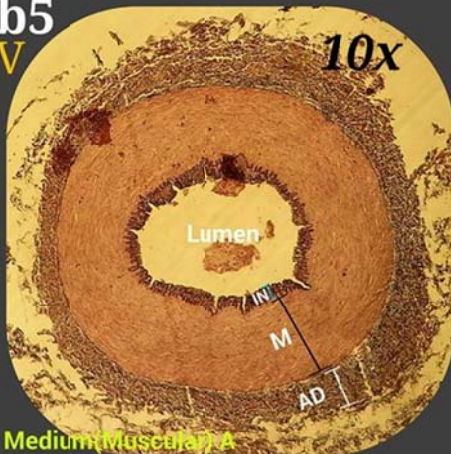
Medium Muscular arteries



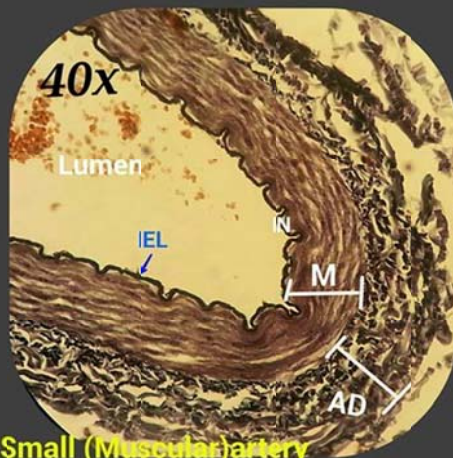
Lab5 BV



Large(Elastic) artery



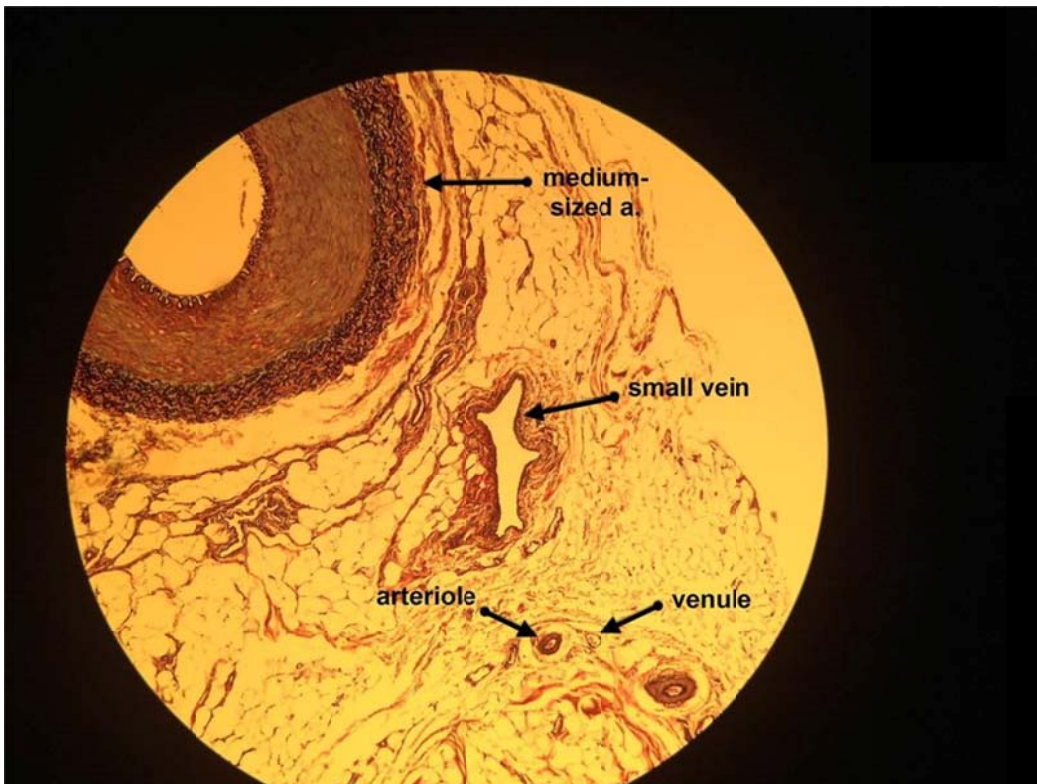
Medium(Muscular) A



Small (Muscular) artery

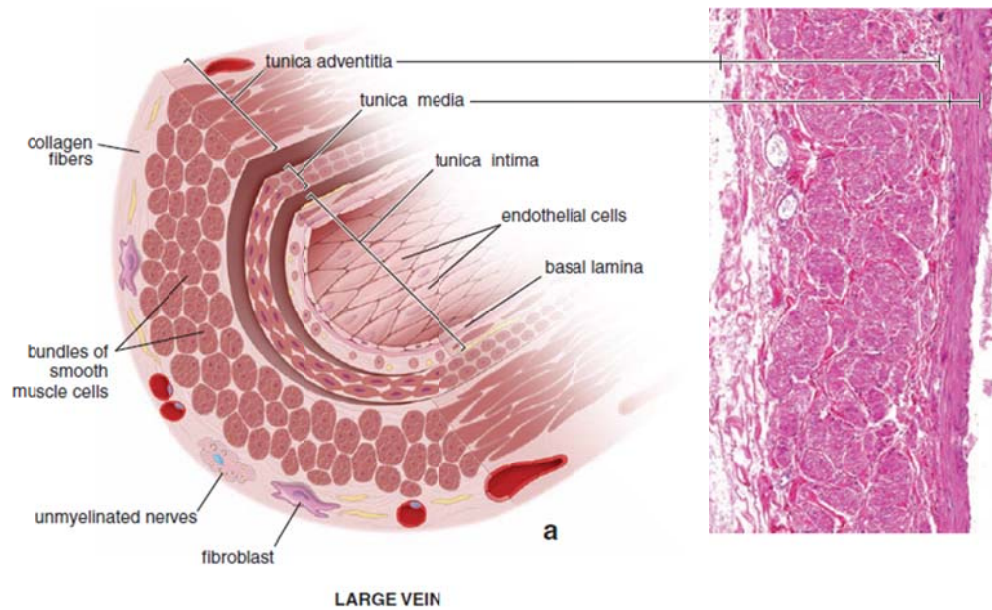
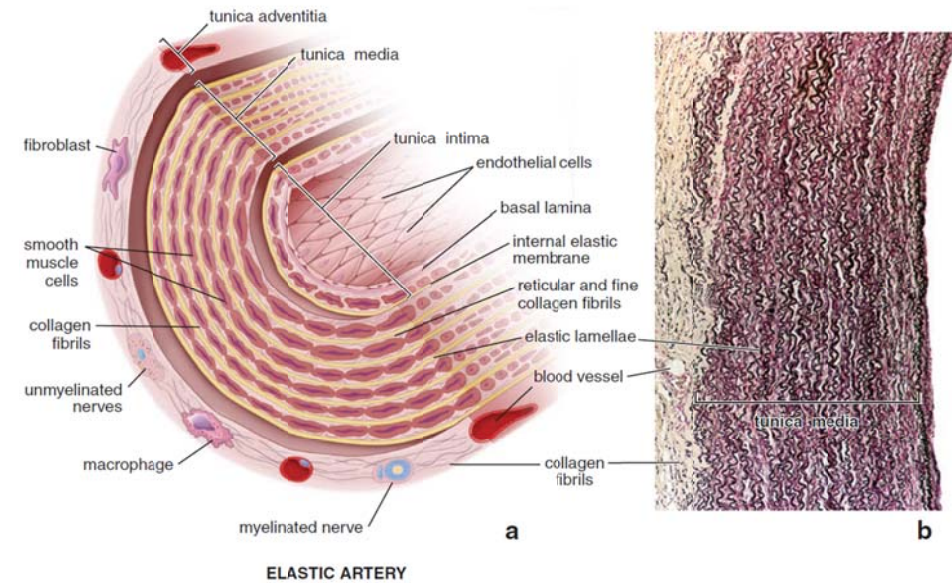


Arteriol

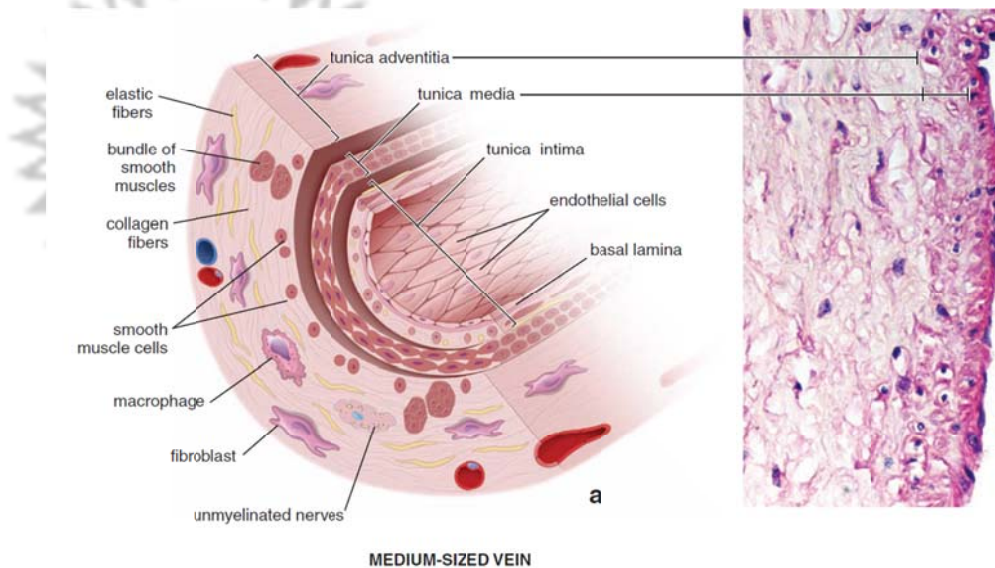


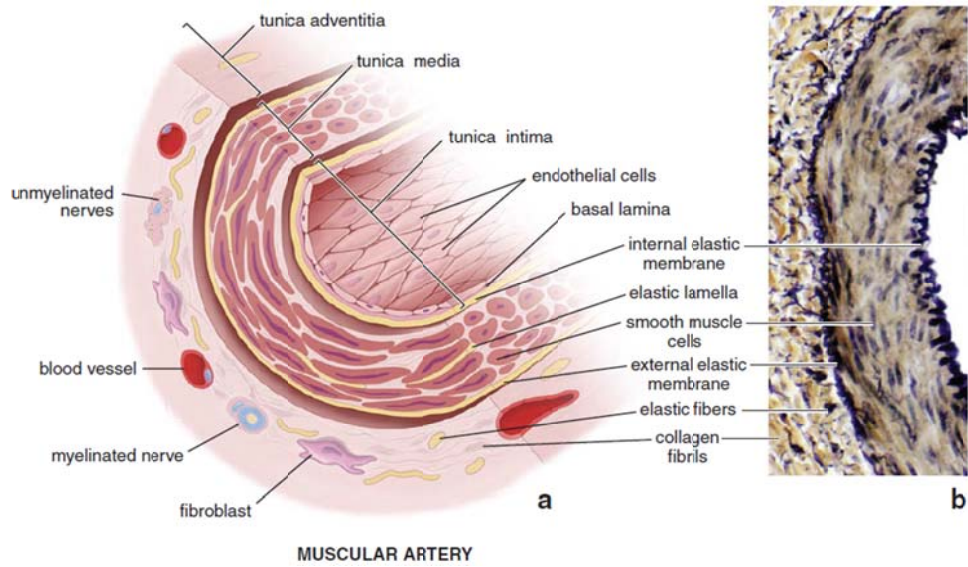
Additional Images (اللبترانين)

Large Vessels

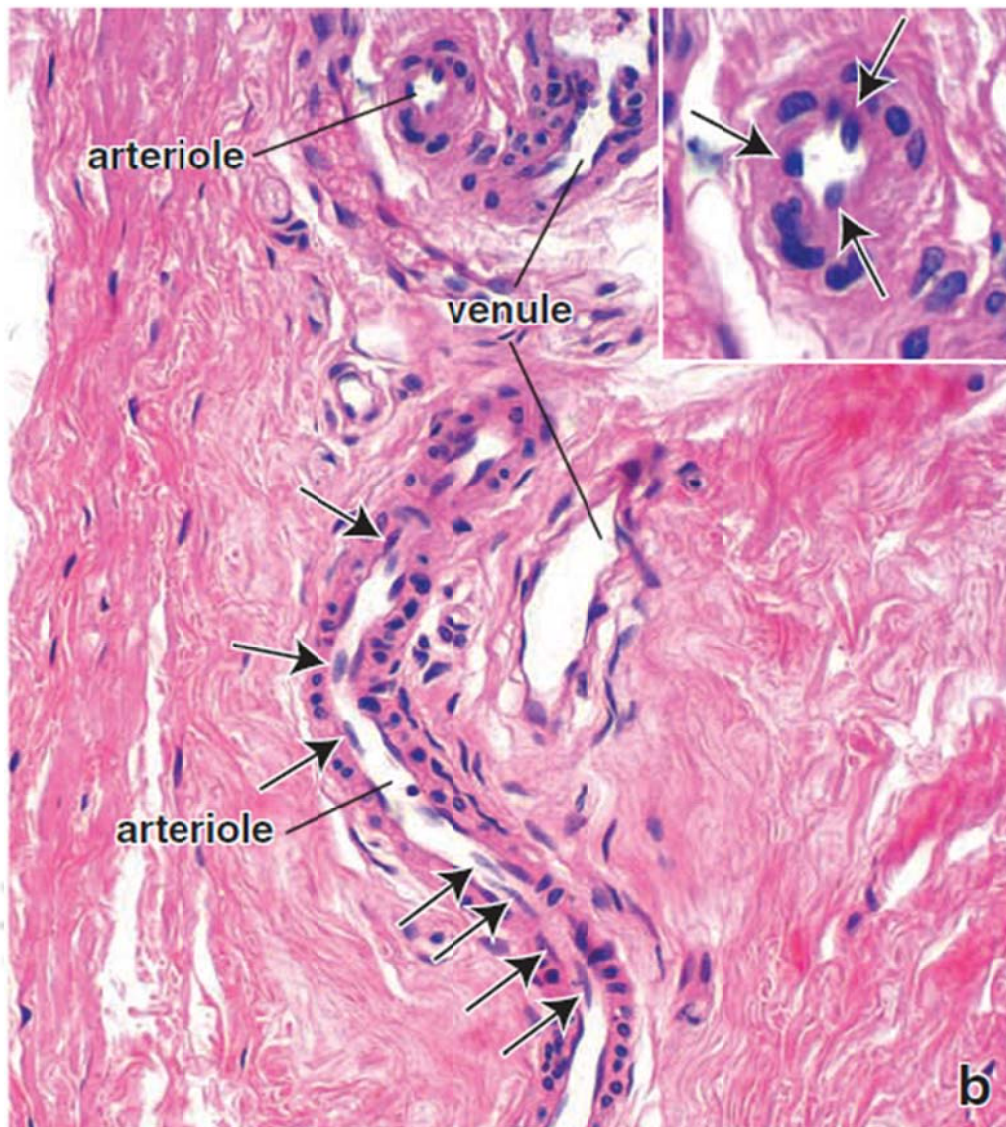


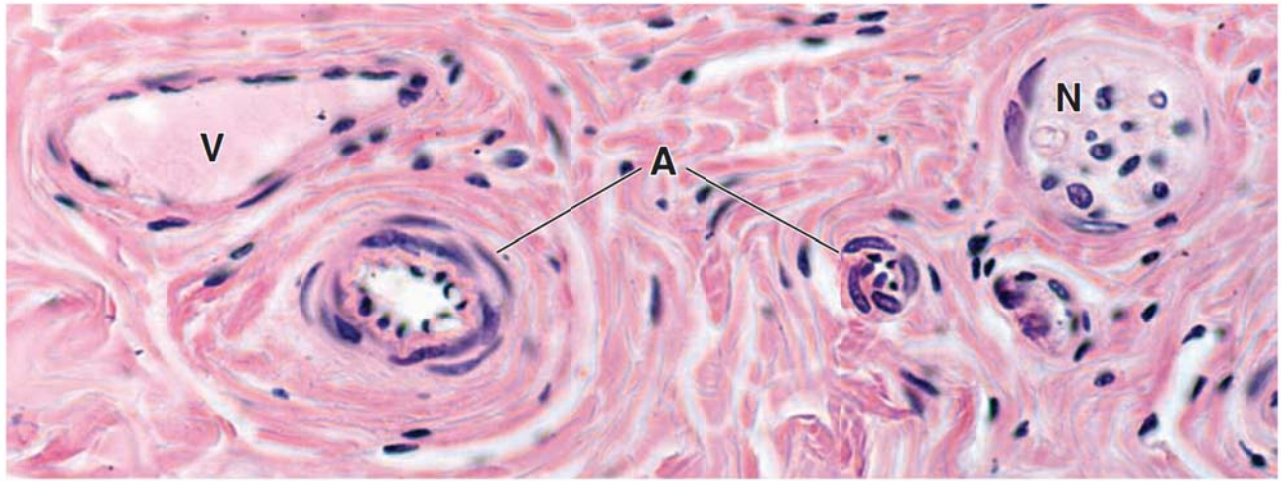
Medium-Sized





Arterioles and Venules





Arteriole, venule, and small nerve, fingertip, human, H&E $\times 600$.

This micrograph shows two cross-sectioned arterioles (*A*) and a venule (*V*). The **arteriole** on the left is identified as a large arteriole, based on the presence of two discrete layers of smooth muscle cells that form the tunica media of the vessel. The nuclei of the muscle cells appear in longitudinal profile as a result of the circumferential arrangement of the cells. The endothelial cell nuclei of the vessel appear as small round profiles surrounding the lumen. These cells are elongate and oriented with their long axis in the direction of flow. Thus,

their nuclei are seen here as cross-sectioned profiles. The arteriole on the right is a very small arteriole, having only a single layer of smooth muscle. Again, the muscle cell nuclei are seen in longitudinal profile. The endothelial cell nuclei appear as the small round profiles at the luminal surface. A venule is seen in proximity to the larger arteriole, and a cross section of peripheral nerve (*N*) is seen in proximity to the smaller arteriole. Compare the wall of the **venule**, consisting only of endothelium and a thin layer of connective tissue, with the arterioles. Also, note the relatively large lumen of the venule.

